

CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

ORDER NO. R5-2006-0022

WASTE DISCHARGE REQUIREMENTS
FOR
COUNTY OF MERCED
AND
CITIES OF ATWATER, DOS PALOS, GUSTINE,
LIVINGSTON, LOS BANOS, AND MERCED
FOR
CONSTRUCTION AND OPERATION
HIGHWAY 59 SOLID WASTE LANDFILL
MERCED COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board) finds that:

1. The County of Merced operates the Highway 59 solid waste landfill about six miles north of the City of Merced, in Sections 23 and 24, T6S, R13E, MDB&M, as shown in Attachment A, which is incorporated herein and made part of this Order. The facility is jointly owned by the County of Merced and the cities of Atwater, Dos Palos, Gustine, Livingston, Los Banos, and Merced (hereafter jointly referred to as Discharger).
2. The existing 222-acre waste management facility consists of four existing unlined Class III waste management units (Units 1-4) covering 88 acres, an existing single-composite-lined Class III Unit covering 25 acres (Unit 5), a Class II surface impoundment, and two storm water retention basins, as shown in Attachment B, which is incorporated herein and made part of this Order. The facility is comprised of Assessor's Parcel Numbers (APN) 052-150-004, 052-070-006, and 052-150-006.
3. The Discharger proposes to construct a new single-composite-lined Class III waste management unit (Unit 6) in an area of approximately 140 acres immediately north of the existing Units. The new Unit will include construction of a storm water retention basin and two Class II surface impoundments as needed for the disposal of leachate. The proposed expansion is in Sections 23, 24, and 25, T6S, R13E, MDB&M.
4. On 14 October 2004, the Central Valley Water Board issued Order No. R5-2004-0162, in which the facility was classified as a Class III waste disposal site for the discharge of municipal solid wastes in accordance with the regulations in effect when the order was issued. This Order maintains the classification of the existing Units as Class III landfills that accept municipal solid waste in accordance with Title 27, California Code of Regulations (CCR), Section 20005, et seq. (Title 27), and allows for the construction of a new waste management unit designed to meet the performance criteria of Title 27 for a Class III landfill for the discharge of municipal solid wastes.

SITE DESCRIPTION

5. The facility is underlain by unconsolidated alluvial plain and fan deposits of Pliocene to Holocene age and deeper alluvial deposits of the Miocene to Pliocene Mehrten Formation. The deposits consist of poorly-sorted clays, silt, sand, and gravel, with some beds of claystone, siltstone, sandstone, and conglomerate. There is a poorly-graded sand zone between 75 and 100 feet below ground surface.
6. The measured hydraulic conductivity of the native soils underlying the Units ranges between 5.5×10^{-4} and 4.5×10^{-4} cm/sec.
7. There are no known Holocene faults within 1,000 feet of the facility. The closest active fault is the Foothills Fault Zone, which is approximately 20 miles to the northeast of the facility. The maximum credible bedrock acceleration for the region is less than 0.2 g, generated from a Richter magnitude 6.5 earthquake along the Foothills Fault Zone. The next closest known fault is the Ortigalita Fault Zone, which is approximately 44 miles to the southwest. The maximum probable ground acceleration for the region is 0.075 g, generated from a Richter magnitude 7.9 earthquake along the San Andreas Fault Zone.
8. Land use within 1,000 feet of the facility is designated for pasture land or agriculture, as specified in the Merced County General Plan.
9. The facility receives an average of 11.74 inches of precipitation per year as measured at the Merced 2 Station (Department of Water Resources bulletin; *Rainfall Depth-Duration-Frequency for California*, revised November 1982, updated August 1986). The mean pan evaporation rate for this facility is 67.31 inches per year as measured at the 5SE Merced 2 Station (DWR Bulletin No. 113-3, April 1975). The Merced 2 Station is approximately six miles southeast of the facility at an elevation of 168 feet above MSL.
10. The 1,000-year, 24-hour precipitation event for the facility is estimated to be 3.60 inches. The 100-year, 24-hour precipitation event for the site is estimated to be 2.85 inches. Both of these figures are based on rainfall data contained in the Department of Water Resources' bulletin described in Finding No. 9 (Merced 2 Station).
11. The waste management facility is not within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community-Panel Number 06018 0175B (revised 16 July 1984).
12. There are five domestic wells and three agricultural wells within one mile of the site. In addition, the site has an agricultural supply well on site for dust control, a domestic supply

well near the landfill office, and a new domestic supply well to service the proposed Unit 6 area. No surface springs or other sources of groundwater supply have been observed.

WASTE AND SITE CLASSIFICATION

13. The Discharger disposes of nonhazardous solid wastes as defined in Title 27 CCR Section 20164. Nonhazardous solid waste includes municipal solid wastes, as referred to in the Code of Federal Regulations, Title 40, Part 258.2.
14. The Discharger proposes to accept treated wood waste at the Highway 59 Landfill. "Treated wood" means wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood, and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. Sec. 136 and following). Existing law regulates the control of hazardous waste, but exempts from the hazardous waste control laws, wood waste that is exempt from regulation under the federal Resource Conservation and Recovery Act of 1976, as amended (RCRA), if the wood waste is disposed of in a municipal landfill that meets certain requirements imposed pursuant to the Porter-Cologne Water Quality Control Act for the classification of disposal sites, and the landfill meets other specified requirements outlined in Sections 25143.1.5 and 25150.7 of the Health and Safety Code. Section 25150.8 of the Health and Safety Code also provides that if treated wood waste is accepted by a solid waste landfill that manages and disposes of the treated wood waste in the manner specified, the treated wood waste shall be deemed to be a solid waste, and not a hazardous or designated waste. The Discharger has indicated that all treated wood waste accepted at the Highway 59 Landfill will be handled and disposed of in accordance with the provisions outlined in Sections 25143.1.5, 25150.7, and 25150.8 of the Health and Safety Code.
15. The site characteristics where the waste management Units are located (see Finding No. 6) do not meet the siting criteria for a new Class III landfill contained in §20260(a) and (b)(1) of Title 27. As such, the site is not suitable for operating new Units or lateral expansions of existing Units for the discharge and containment of Class III wastes as described in Finding Nos. 13 and 14, without the construction of additional waste containment features in accordance with Title 27 CCR Section 20260(b)(2) and State Water Resources Control Board Resolution No. 93-62.
16. Leachate generated from the existing lined Unit exhibits concentrations of volatile organic compounds and inorganic waste constituents of concern in excess of water quality standards. In addition, the site characteristics where the Unit is located (see Finding Nos. 5, 6, and 20) do not permit adequate attenuation of the leachate in the event of a release from the Unit. As such, the leachate is classified as a designated waste, pursuant to the definition of "designated waste" contained in §13173 of the California Water Code.

SURFACE AND GROUND WATER CONDITIONS

17. The *Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin, Fourth Edition* (hereafter Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
18. Surface drainage from the eastern half of the site flows to a seasonal pond, which is near the southeast corner of the facility. This pond may drain to Parkinson Creek, but only during extreme conditions. Parkinson Creek joins Fahrens Creek approximately two miles south-southeast of the facility. Surface drainage from the western half of the facility flows into a storm drainage pond, which is at the southwest corner of the facility. This pond may drain into a Caltrans drainage, which is also tributary to Fahrens Creek. Fahrens Creek is tributary to Bear Creek and the San Joaquin River, in the Merced Hydrologic Area (535.80) of the San Joaquin Basin. Storm water runoff is permitted by California General Industrial Storm Water Permit, Order No. 97-03-DWQ, permittee number 5B24S000444.
19. The landfill is on the floor of the central San Joaquin Valley. The potential or existing beneficial uses of the San Joaquin River from Sack Dam to the mouth of the Merced River, as specified in the Basin Plan, are municipal and domestic supply, agricultural irrigation supply, stock watering, industrial process and service supply, recreation, freshwater habitat, fish migration and spawning, wildlife habitat, groundwater recharge, fresh water replenishment, and esthetic enjoyment. Parkinson Creek, Fahrens Creek, and Bear Creek, as tributaries to the San Joaquin River, are designated these same uses.
20. The first encountered groundwater is about 65 feet below the native ground surface. Groundwater elevations generally range from 140 feet above MSL near the northeastern corner of Unit 1 to 130 feet above MSL near the southwestern end of the facility. The groundwater is unconfined. The depth to groundwater fluctuates seasonally as much as nine feet.
21. Monitoring data indicates background groundwater quality has an electrical conductivity (EC) ranging between 200 and 300 micromhos/cm, with total dissolved solids (TDS) ranging between 140 and 210 mg/l.
22. The direction of groundwater flow is toward the southwest. The direction of groundwater flow varies seasonally and periodically flows toward the south. The average groundwater gradient is approximately 0.001 feet per foot. The average groundwater velocity is 1.5 to 1.9 feet per year.
23. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are

domestic and municipal, agricultural, and industrial supply.

GROUNDWATER MONITORING

24. The groundwater detection monitoring network for the existing Units consists of six background monitoring wells (MW-5, MW-6, MW-7, MW-8, MW-13, MW-14); one upgradient monitoring well (MW-4-A); and seven downgradient monitoring wells (MW-1, MW-2-A, MW-9, MW-10, MW-11, MW-12, MW-20). Wells MW-5, MW-6, MW-7, MW-8, MW-13, and MW-14 were installed for background groundwater monitoring in the vicinity of the planned northward expansion area. Wells MW-13, MW-14, and MW-6 will be decommissioned upon construction of the proposed expansion Unit. Well MW-20 is used to monitor the groundwater immediately downgradient of the existing Class II surface impoundment.
25. The vadose zone detection monitoring system consists of geomembrane-lined pan lysimeters installed beneath the leachate collection and removal system collection pipes and sumps of the single-composite-lined Unit. The Discharger proposes to install pan lysimeters beneath composite-lined landfill units constructed in the 140-acre expansion area to the north. The Discharger has installed gas monitoring wells along the perimeters of the unlined waste management unit. These gas wells will also serve as vadose zone monitoring devices for the unlined areas.
26. The groundwater evaluation monitoring network for the unlined Unit consists of monitoring wells MW-15, MW-16, MW-17, MW-18, and MW-19. Well MW-19 is screened in a deeper zone to evaluate the vertical extent of groundwater degradation.
27. A pan lysimeter is installed beneath the centerline of the existing Class II surface impoundment. In addition, two suction lysimeters are installed beneath two opposing slopes of the surface impoundment. These devices serve as the vadose zone monitoring system for the Class II surface impoundment.
28. The Discharger's existing detection monitoring program for groundwater at this facility satisfies the requirements contained in Title 27.
29. Volatile organic compounds (VOCs) are often detected in a release from a landfill, and are the primary waste constituents detected in groundwater beneath a municipal solid waste landfill (see Finding No. 34). Since volatile organic compounds are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a Unit.
30. Sections 20415(e)(8) and (9) of Title 27 provide for the non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a

release from a Unit in accordance with §20415(b)(1)(B)2.-4. of Title 27. However, Title 27 does not specify a specific method for non-statistical evaluation of monitoring data.

31. The Central Valley Water Board may specify a non-statistical data analysis method pursuant to Section 20080(a)(1) of Title 27. Section 13360(a)(1) of the California Water Code allows the Central Valley Water Board to specify requirements to protect underground or surface waters from leakage from a solid waste site, which includes a method to provide the best assurance of determining the earliest possible detection of a release.
32. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a Unit, this Order specifies a non-statistical method for the evaluation of monitoring data.
33. The specified non-statistical method for evaluation of monitoring data provides two criteria (or triggers) for making the determination that there has been a release of non-naturally occurring waste constituents from a Unit. The presence of two non-naturally occurring waste constituents above their respective method detection limit (MDL), or one non-naturally occurring waste constituent detected above its practical quantitation limit (PQL), indicates that a release of waste from a Unit has occurred. Following an indication of a release, verification testing will be conducted to determine whether there has been a release from the Unit, or there is a source of the detected constituents other than the landfill, or the detection was a false detection. Although the detection of one non-naturally occurring waste constituent above its MDL is sufficient to provide for the earliest possible detection of a release, the detection of two non-naturally occurring waste constituents above the MDL as a trigger is appropriate due to the higher risk of false-positive analytical results and the corresponding increase in sampling and analytical expenses from the use of one non-naturally occurring waste constituent above its MDL as a trigger.

GROUNDWATER DEGRADATION

34. The volatile organic compound (VOC) dichlorodifluoromethane has repeatedly been detected in detection monitoring well MW-2A at concentrations above the water quality objective since September 1993. No Maximum Contaminant Levels have been established for this waste constituent. The applicable water quality objective for dichlorodifluoromethane is the U.S.E.P.A. National Ambient Water Quality Criteria, One-in-a-Million Incremental Cancer Risk Estimate for Health and Welfare Protection (0.19 µg/l). In addition, tetrachloroethylene has been detected in monitoring well MW-12 at concentrations above the Maximum Contaminant Level (MCL) of 5 µg/l. Other VOCs detected on two or more consecutive occasions below water quality goals include: benzene and toluene in wells MW-1, MW-3, MW-4A, and MW-5; and tetrachloroethylene and trichlorofluoromethane in MW-2A.

35. The Discharger is currently conducting evaluation monitoring in accordance with Cleanup and Abatement Order No. 98-730, issued by the Executive Officer in 1998. However, the evaluation monitoring program has not been completed to date.
36. The lateral extent of groundwater degradation has not been determined for non-naturally-occurring waste constituents. Additional groundwater evaluation is needed to delineate the nature and extent of non-naturally-occurring waste constituents in groundwater.
37. This order requires completion of the evaluation monitoring program and submission of a final feasibility study for corrective action.

EVALUATION MONITORING PROGRAM

38. The discharge of waste constituents that has caused a degradation of groundwater is a violation of Waste Discharge Requirements Order No. R5-2004-0162, Prohibitions A.5 and A.6.
39. The Discharger is in violation of Order No. R5-2004-0162, Detection Monitoring Specification E.4, which requires the Discharger not to exceed the water quality protection standard established pursuant to Monitoring and Reporting Program No. R5-2004-0162. Evidence of exceedence of the standard for volatile organics occurs when the constituent is detected by the appropriate method. Non-naturally occurring VOCs exceeding the water quality protection standard have been repeatedly detected in the monitoring wells (see Finding No. 34).
40. Subsections 20385(a) (2) and (4) of Title 27 requires the Discharger to initiate an evaluation monitoring program whenever there is significant evidence of a release from a Unit during a detection monitoring program, and to institute a corrective action program when the Central Valley Water Board determines that the assessment of the nature and extent of the release and the design of a corrective action program have been satisfactorily completed. These are considered cleanup and abatement activities pursuant to California Water Code §13304. These programs must be applied to all water bearing zones affected by the release, including perched water zones.
41. An evaluation monitoring program is used to assess the nature and extent of a release from a Unit and to design a corrective action program in accordance with §20430 of Title 27 [Title 27, §20425(a)(2)]. In assessing the nature and extent of a release from a Unit, the Discharger is obligated to include a determination of the spatial distribution and concentration of each constituent of concern throughout the zone affected by the release [Title 27, §20425(b)]. The extent of a release is determined when the constituents of concern are not detected above their respective water quality protection standard at

groundwater sampling locations out from all sides of the Unit where the constituents of concern have exceeded the water quality protection standard.

42. Evaluation monitoring is required to be implemented when the detection monitoring program determines that waste constituents have leaked from the Unit (see Finding No. 34). In the case of organic compounds that are not naturally occurring, their presence in samples from detection monitoring wells is evidence of a release from the Unit. For naturally occurring compounds and constituents, evidence of a release is based on a measurably significant increase in their concentration(s) above the upper tolerance limit established in the water quality protection standard.
43. Non-naturally occurring organic compounds have been continuously detected in samples from the detection monitoring wells (see Finding No. 34). This detection of waste constituents constitutes evidence of a release from the Unit. The Discharger is therefore obligated to complete an evaluation monitoring program in accordance with §20425 of Title 27 in order to determine the extent of migration of the waste constituents, to assess their potential threat to the beneficial uses of the areal groundwater, and to prepare a corrective action program in accordance with §20430 of Title 27. The vertical extent of groundwater degradation has been adequately determined for non-naturally occurring waste constituents.
44. Section 20420(k)(5) of Title 27 requires that within 90 days of determining a measurably significant evidence of a release, a discharger shall submit to the Central Valley Water Board an amended report of waste discharge, including information specified in §20420(k)(5) of Title 27, to establish an evaluation monitoring program meeting the provisions of §20425 of Title 27.
45. Section 20420(k)(6) of Title 27 requires that within 180 days of determining a measurably significant evidence of a release, a discharger shall submit an engineering feasibility study for a corrective action program necessary to meet the requirements of §20430 of Title 27. At a minimum, the feasibility study shall contain a detailed description of the corrective action measures that could be taken to achieve background concentrations for all constituents of concern.
46. Section 20425(b) of Title 27 requires a discharger to complete an evaluation of the nature and extent of a release from the Unit and to submit the assessment to the Central Valley Water Board within 90 days of establishing an evaluation monitoring program.
47. Section 20425(c) of Title 27 requires a discharger to submit an updated engineering feasibility study for corrective action based on the results of the evaluation monitoring program and an amended report of waste discharge to establish a corrective action program meeting the requirements of §20430 of Title 27 to the Central Valley Water Board within 90 days of establishing an evaluation monitoring program.

48. Section 20425(d) of Title 27 requires a discharger to submit an amended report of waste discharge to establish a corrective action program meeting the requirements of §20430 of Title 27 to the Central Valley Water Board within 90 days of establishing an evaluation monitoring program. The proposed corrective action program is to be based on the data collected pursuant to §20425(b) of Title 27, and on the engineering feasibility study for corrective action submitted pursuant to §20425(c) of Title 27
49. An evaluation monitoring program was required to have been conducted within the regulatory time frame following the effective date of the Article 5 revisions to Title 23, CCR, §2510 et seq. (Chapter 15, effective 1 July 1991) because a significant statistical evidence of a release has existed since 1993 (see Finding No. 34).
50. The Discharger has not complied with the time frames contained in former Chapter 15 or Title 27 for the completion of an evaluation monitoring program and the submission of a proposed corrective action program (see Finding Nos. 44, 45, 46, and 47), and is therefore in non-compliance with the applicable provisions of Title 27.
51. The Discharger, being a public entity, is unable to comply with the regulatory time frames contained in Title 27 due to the time required to conduct the public bidding process and budgetary constraints. As such, the Discharger has requested an alternate time schedule by which to comply with the evaluation monitoring program requirements contained in Title 27.
52. This Order establishes a time schedule for the completion of an evaluation monitoring program, the submission of an updated engineering feasibility study for the establishment of a corrective action program, and the submission of a report of waste discharge for a corrective action program. Failure to comply with the time schedule contained in this Order may subject the Discharger to a civil monetary liability.

CONSTRUCTION AND ENGINEERED ALTERNATIVE

53. On 17 June 1993, the State Water Resources Control Board adopted Resolution No. 93-62 implementing a State Policy for the construction, monitoring, and operation of municipal solid waste landfills that is consistent with the federal municipal solid waste regulations promulgated under Title 40, Code of Federal Regulations, Part 258 (Subtitle D).
54. Resolution No. 93-62 requires the construction of a specified composite liner system at new municipal solid waste landfills, or expansion areas of existing municipal solid waste landfills, that receive wastes after 9 October 1993.

55. Resolution No. 93-62 also allows the Central Valley Water Board to consider the approval of engineered alternatives to the prescriptive standard. Section III.A.b. of Resolution No. 93-62 requires that the engineered alternative liner systems be of a composite design similar to the prescriptive standard.
56. Section 20080(b) of Title 27 allows the Central Valley Water Board to consider the approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative in accordance with §20080(c)(1) and (2), the Discharger must demonstrate that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in §20080(b), or would be impractical and would not promote attainment of applicable performance standards. The Discharger must also demonstrate that the proposed engineered alternative liner system is consistent with the performance goal addressed by the particular prescriptive standard, and provides protection against water quality impairment equivalent to the prescriptive standard in accordance with §20080(b)(2) of Title 27.
57. Section 13360(a)(1) of the California Water Code allows the Central Valley Water Board to specify the design, type of construction, and/or particular manner in which compliance must be met in waste discharge requirements or orders for the discharge of waste at solid waste disposal facilities.
58. The Discharger has proposed the construction of an engineered alternative single-composite liner system for the planned Unit 6. The liner would be comprised of the following, in ascending order: a 12-inch subgrade layer recompact to a hydraulic conductivity not to exceed 1×10^{-6} cm/sec or meeting specific compaction and gradation criteria; a geosynthetic clay liner (GCL) consisting of a 5-mm thick layer of sodium bentonite sandwiched between two geotextiles (bottom geotextile nonwoven); a 60-mil thick synthetic flexible membrane of HDPE; a 12-inch gravel leachate drainage layer; a nonwoven geotextile filter fabric; and a 24-inch thick soil operations layer.
59. Sideslope liners for the planned Unit 6 are proposed to be constructed of the same materials and in the same sequence and manner as the bottom liner system, but without the 12-inch gravel drainage layer and nonwoven geotextile filter fabric. The sideslope subgrade will be prepared in an appropriate manner using accepted engineering and construction methods so as to provide a surface that is smooth and free from rocks, sticks, and other debris that could damage or otherwise limit the performance of the geosynthetic clay layer and/or geomembrane, and certified in accordance with this Order and the approved Construction Quality Assurance Plan.
60. The Discharger has demonstrated that construction of a Subtitle D prescriptive standard liner system for Unit 6 would be unreasonable and unnecessarily burdensome when compared to the proposed engineered alternative design. There is no clay source on-site or

nearby and the cost of importing clay from off-site or mixing on-site soils with bentonite would cost substantially more than the alternative design. The Discharger has also demonstrated that the proposed engineered alternative is consistent with the performance goals of the prescriptive standard and affords at least equivalent protection against water quality impairment.

61. The proposed leachate collection and removal system includes a minimum 12-inch thick drainage layer composed of granular material with a minimum hydraulic conductivity of 0.3 centimeters per second (cm/s). The design leachate flow volume is 4.4 gallons per minute.
62. The proposed vadose zone monitoring system includes geomembrane-lined pan lysimeters installed beneath the leachate collection and removal system collection pipes and sumps. A pan lysimeter will be installed beneath the liner system for the purposes of vadose zone monitoring. The pan lysimeter will consist of: 1) an underlying 60-mil HDPE liner on a prepared subgrade below the leachate sump(s) and a length of the leachate collection and removal system troughs; and 2) perforated or slotted 3-inch diameter HDPE piping encased in drainage gravel.

LANDFILL LINER PERFORMANCE DEMONSTRATION

63. On 15 September 2000, the Central Valley Water Board adopted Resolution No. 5-00-213, "Request For The State Water Resources Control Board To Review The Adequacy Of The Prescriptive Design Requirements For Landfill Waste Containment Systems To Meet The Performance Standards Of Title 27." The State Water Board responded, in part, that "a single composite liner system continues to be an adequate minimum standard"; however, the Central Valley Water Board "should require a more stringent design in a case where it determines that the minimum design will not provide adequate protection to a given body of groundwater."

In a letter dated 17 April 2001, the Executive Officer notified owners and operators of Solid Waste Landfills that "the Central Valley Water Board will require a demonstration that any proposed landfill liner system to be constructed after 1 January 2002 will comply with Title 27 performance standards. A thorough evaluation of site-specific factors and cost/benefit analysis of single, double and triple composite liners will likely be necessary."

64. In accordance with the Executive Officer's letter of 17 April 2001, the Discharger submitted a landfill liner design performance report to demonstrate that the proposed engineered alternative design would meet the performance standard contained in Section 20310(c) of Title 27 for a Class III landfill. The demonstration utilized a model to predict the performance of the proposed liner design and the fate and transport of a release of waste constituents from Unit 6.

65. Concerns regarding the sensitivity of the modeling results to changes of input data were raised by the Central Valley Water Board staff and addressed by the Discharger with a sensitivity analysis of the model.
66. The following concerns with the engineered alternative landfill liner design and site conditions were also considered:
- The barrier portion of the engineered alternative liner design (the geomembrane and the GCL) would be less than 0.5 inches thick. The thickness of the engineered alternative liner design makes it vulnerable to damage during construction and during the placement of wastes.
 - The vadose zone does not offer substantial protection for the groundwater. The bottom of the proposed expansion will be approximately 35 feet above the highest anticipated groundwater elevation.
 - Groundwater is degraded from the existing unlined portion of the landfill.
67. The thickness and the construction criteria of the prepared subgrade and the thickness of the operations layer as noted in Finding No. 58 were modified to address the concerns listed in Finding No. 66.
68. To ensure proper installation of the engineered alternative landfill liner system, the Discharger has agreed to perform an electronic leak detection survey (ELDS) over the entire base of the liner system subsequent to placement of the operations layer on the liner and leachate collection and removal system to detect and repair any liner defects prior to placing waste. In addition to performing the ELDS, the Discharger will place select waste over the operations layer to reduce the potential damage to the base liner during initial refuse filling operations.
69. Based on the results of the model showing that the engineered alternative liner design would contain the wastes discharged to the Unit, and the design and construction features of the engineered alternative liner system, the Central Valley Water Board finds that the engineered alternative liner meets the performance standard contained in Title 27. The Discharger has also demonstrated that the proposed liner system meets the approval criteria set forth in Section 20080(b) of Title 27 for engineered alternative designs. The Discharger therefore proposes a liner system which will be designed, constructed, and operated in accordance with the criteria set forth in Title 27, and the provisions in State Water Resources Control Board Resolution No. 93-62 for municipal solid wastes.

SURFACE IMPOUNDMENT CONSTRUCTION

70. The existing Class II surface impoundment (Impoundment 1) was designed and constructed for containing leachate generated from the existing single-composite-lined landfill Unit. Available capacity for Impoundment 1 is approximately 1.12 million gallons while maintaining two feet of freeboard. The minimum elevation of Impoundment 1 is approximately 196 feet above MSL.
71. The Impoundment 1 liner system consists of a HDPE geomembrane having a minimum thickness of 80 mils, underlain by a geocomposite drainage net and two feet of clay soil compacted to a maximum hydraulic conductivity of 1×10^{-6} cm/sec.
72. The Discharger has not submitted a demonstration that construction of the proposed surface impoundment liner will meet the performance standard for a Class II surface impoundment contained in §20310 of Title 27. Insufficient data exists to determine whether a significant volume of leachate is being released from the surface impoundment liner. Therefore, this Order requires the construction of a double-composite liner system for the proposed surface impoundments. A double composite liner system will meet the performance standards for Class II liquid wastes. Alternatively, the Discharger may submit a Report of Waste Discharge with a demonstration that construction of a proposed alternative surface impoundment liner system will meet the performance standard for the containment of a Class II liquid and request a revision of this Order.

CEQA AND OTHER CONSIDERATIONS

73. The Merced County Board of Supervisors certified the final Environmental Impact Report (EIR) for the facility expansion on 13 August 1996. The Merced County Public Works Department filed a Notice of Determination on 17 September 1996, in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) and CEQA guidelines (14 CCR Section 15000 et seq.). The Central Valley Water Board considered the EIR and incorporated mitigation measures from the environmental impact report into these waste discharge requirements designed to prevent potentially significant impacts to design facilities and to water quality, as defined in Finding Nos. 74 through 83.

The EIR identified portions of the landfill expansion area as wetlands that need to be protected in accordance with state and federal regulations.

74. Pursuant to 40 CFR §258.12, the Discharger is required to make certain demonstrations if a Unit is to be located in wetlands. The term “wetlands” includes those resources as defined by 40 CFR §232.2(r).
75. The proposed Unit will be located within areas containing “wetlands,” including vernal pools and “seasonal” wetlands.

76. Because the construction and operation of the proposed landfill expansion will impact wetland habitat, the Discharger must make the following demonstrations pursuant to 40 CFR §258.12:
- a) The Unit as proposed has no other available and practicable location that results in less impact to wetlands;
 - b) The Unit as proposed will not cause or contribute to violation of any applicable State water quality standard;
 - c) The Unit as proposed will not violate a toxic effluent standard or prohibition under Section 307 of the federal Clean Water Act;
 - d) The Unit as proposed will not jeopardize the continued existence or endangered or threatened species or impact critical habitat;
 - e) The Unit as proposed will not violate any requirement under the Marine Protection, Research and Sanctuaries Act of 1972;
 - f) The Unit as proposed will not cause or contribute to significant degradation of wetlands; and
 - g) The Unit as proposed avoids on-site wetlands to the maximum extent practicable and where impracticable, the impact is minimized and those impacts are mitigated to ensure no net loss of wetlands.
77. The Discharger has demonstrated that no other available practicable alternative to the proposed site exists. Both the Edendale Creek and the Vineyard sites pose both environmental and cost constraints making them impracticable. The Edendale Creek site contains wetlands and other sensitive habitat, as well as being cost prohibitive. Likewise, the Vineyard site is cost prohibitive and its use as a landfill site would not comply with the County of Merced General Plan. Additionally, the Vineyard site's proximity to Castle Airport makes the site impracticable. Transport of waste out of Merced County would result in impracticable costs and result in increased environmental impacts or risks. On-site waste reclamation at the existing landfill site would be impracticable due to cost. Waste reduction and landfilling to the existing facility would not yield the required capacity under state law requirements.
78. The Discharger has demonstrated that the Unit will not cause or contribute to the violation of an applicable State water quality standard. The Unit will be permitted and operated to meet the Water Quality Protection Standard adopted by the Central Valley Water Board.

These standards for the State of California are embodied in regulation within California Code of Regulations, Title 27, Section 20420.

79. The Discharger has demonstrated that the Landfill as proposed will not violate a toxic effluent standard or prohibition under Section 307 of the federal Clean Water Act. The potential stormwater/surface water discharge point for the Landfill expansion is from two stormwater retention basins. The contents of the basin are sampled and tested under industrial storm water NPDES permit No. 5B24S000444. This monitoring program requires sampling and testing for potentially toxic constituents within the collected stormwater, prior to its release. To date, the results have indicated that the monitored naturally-occurring waste constituents are not present above the detection limits or the relevant health standards for the potentially toxic compounds. The monitoring program is designed to limit discharge of surface water effluent to only quantities that are consistent with minimum allowed concentrations.
80. The Discharger has demonstrated that the Unit as proposed will not jeopardize the continued existence or endangered or threatened species or impact critical habitat. The United States Fish and Wildlife Service has found that the Unit will not jeopardize the continued existence of any of the listed invertebrate species found within the Unit, and has issued a Biological Opinion pursuant to the federal Endangered Species Act allowing the facility to be constructed.
81. The Discharger has demonstrated that the Landfill as proposed will not violate any requirement under the Marine Protection, Research and Sanctuaries Act of 1972.
82. The Discharger has demonstrated that the Landfill as proposed will not cause or contribute to significant degradation of wetlands. The Landfill waste will consist mainly of residential and commercial wastes, industrial and demolition debris wastes, wood, yard waste, clean fill soil and construction debris, and non-friable asbestos. In accordance with this Order and Solid Waste Facility Permit No. 24-AA-0001, only nonhazardous solid wastes suitable for disposal in a municipal solid waste landfill are accepted for disposal. The potential for a release, including a catastrophic release, of waste from the Highway 59 Landfill is remote. The landfill will operate under design and operating standards that limit erosion potential, and capture sediment within one of three stormwater retention basins provided for the landfill.
83. The Discharger has demonstrated that the Unit as proposed avoids on-site wetlands to the maximum extent practicable and where impracticable, the impact is minimized and those impacts are mitigated to ensure no net loss of wetlands. The Discharger has avoided a significant portion of the on-site wetlands and further avoidance is impracticable. The Discharger is required under its federal CWA Section 404 permit and the Biological Opinion to preserve in perpetuity a 168-acre wetland preserve and mitigation area. The

Discharger will construct wetland acreage within the mitigation area in compensation for the acreage lost as part of the Landfill construction.

PROCEDURAL REQUIREMENTS

84. This order implements:

- a. The *Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin, Fourth Edition*;
- b. The prescriptive standards and performance goals of Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions;
- c. The prescriptive standards and performance criteria of RCRA Subtitle D, Part 258; and
- d. State Water Resources Control Board Resolution No. 93-62, Policy for Regulation of Discharges of Municipal Solid Waste, adopted 17 June 1993.

85. Section 13267(b) of California Water Code provides that: "In conducting an investigation specified in subdivision (a), the Central Valley Water Board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports." The monitoring and reporting program required by this Order and the attached Monitoring and Reporting Program No. R5-2006-0022 are necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges the waste subject to this Order.

86. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.

87. The Central Valley Water Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

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88. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.
89. Any person affected by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Sections 2050 through 2068, Title 23, California Code of Regulations. The petition must be received by the State Water Board, Office of Chief Counsel, P.O. Box 100, Sacramento, California 95812, within 30 days of the date of issuance of this Order. Copies of the laws and regulations applicable to the filing of a petition are available on the Internet at http://www.waterboards.ca.gov/water_laws/index.html and will be provided on request.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Order Nos. R5-2004-0162 and 98-730 are rescinded, and that the County of Merced and the cities of Atwater, Dos Palos, Gustine, Livingston, Los Banos, and Merced, their agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of ‘hazardous waste’ or ‘designated waste’ is prohibited. For the purposes of this Order, the term ‘hazardous waste’ is as defined in Title 23, California Code of Regulations, Section 2510 et seq., and ‘designated waste’ is as defined in Title 27.
2. The discharge of a waste outside of a Unit or portions of a Unit specifically designed for its containment is prohibited.
3. The discharge of waste to a closed Unit is prohibited.
4. The discharge shall not cause the release of pollutants or waste constituents in a manner which could cause a condition of nuisance, degradation, contamination, or pollution of groundwater to occur, as indicated by the most appropriate statistical or nonstatistical data analysis method and retest method listed in this Order, the Monitoring and Reporting Program, or the Standard Provisions and Reporting Requirements.
5. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.
6. The discharge shall not cause any increase in the concentration of waste constituents in soil-pore gas, soil-pore liquid, soil, or other geologic materials outside of the Unit if such waste constituents could migrate to waters of the State — in either the liquid or

the gaseous phase — and cause a condition of nuisance, degradation, contamination, or pollution.

B. DISCHARGE SPECIFICATIONS

1. Nonhazardous solid wastes shall only be discharged to either:
 - a. The existing single-composite-lined Unit; or
 - b. The existing unlined Unit; or
 - c. To a Unit equipped with a composite liner containment system which meets the requirements for both liners and leachate collection and removal systems specified under D. Construction Specifications.
2. The discharge shall remain within the designated disposal area at all times.
3. The waste discharged to the initial three feet of all new waste management units or any expansion of an existing waste management unit, as measured from the top of the operations layer of the liner system, shall consist only of “packer waste” or other waste that will not pose a danger of physical damage to the liner system.
4. “Treated wood” wastes may be discharged, but only to an area equipped with a composite liner and leachate collection and removal system, as described in Construction Specification D.3, and shall be handled in accordance with California Health and Safety Code Sections 25143.1.5 and 250150.7. “Treated wood” means wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. Sec. 136 and following). This may include but is not limited to waste wood that has been treated with chromated copper arsenate (CCA), pentachlorophenol, creosote, acid copper chromate (ACC), ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), or chromated zinc chloride (CZC).
5. Treated wood must be managed to ensure consistency with Sections 25143.1.5 and 25150.7 of the Health and Safety Code. If a verified release is detected from the waste management unit where treated wood is disposed, the disposal of treated wood shall be terminated at the unit with the verified release until corrective action ceases the release.

6. Discharge Specifications B.4 and B.5, above, apply only to treated wood waste that is a hazardous waste solely due to the presence of a preservative in the wood, and is not subject to regulation as a hazardous waste under the federal act.

C. FACILITY SPECIFICATIONS

1. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order.
2. The Discharger shall immediately notify the Central Valley Water Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
3. Water used for facility maintenance shall be limited to the minimum amount necessary for dust control, and construction.
4. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.
5. Methane and other landfill gases shall be adequately vented, removed from the Unit, or otherwise controlled to prevent the danger of adverse health effects, nuisance conditions, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.
6. Surface drainage within the waste management facility shall either be contained on-site or be discharged in accordance with applicable storm water regulations.
7. The Discharger shall maintain a *Storm Water Pollution Prevention Plan* and *Monitoring Program and Reporting Requirements* in accordance with State Water Resources Control Board Order No. 97-03-DWQ, or retain all stormwater on-site.

D. CONSTRUCTION SPECIFICATIONS

General Construction Specifications

1. The Discharger shall submit for Executive Officer review and approval **prior to** construction, design plans and specifications for new Units and impoundments and expansions of existing Units, that include the following:

- a. A Construction Quality Assurance Plan meeting the requirements of Title 27 CCR Section 20324; and
 - b. A geotechnical evaluation of the area soils, evaluating their use as the base layer; and
 - c. An unsaturated zone monitoring system, which is demonstrated to remain effective throughout the active life, closure, and postclosure maintenance periods of the Unit, which shall be installed beneath the composite liner system in accordance with Title 27 CCR Section 20415(d).
2. The Discharger may propose changes to a liner system design prior to construction, provided that approved components are not eliminated, the engineering properties of the components are not substantially reduced, and the proposed liner system results in the protection of water quality equal to or greater than the design prescribed by Title 27 and this Order. The proposed changes may be made following approval by the Executive Officer. Substantive changes to the design require reevaluation as an engineered alternative and approval by the Central Valley Water Board.
3. Construction shall proceed only after all applicable construction quality assurance plans have been approved by Executive Officer.
4. Following the completion of construction of a Unit or Impoundment, or portion of a Unit, and prior to discharge onto the newly constructed liner system, the final documentation required in Title 27 CCR Section 20324(d)(1)(C) shall be submitted to the Executive Officer for review and approval. The report shall be certified by a registered civil engineer or a certified engineering geologist. It shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, and with the prescriptive standards and performance goals of Title 27.
5. A third party independent of both the Discharger and the construction contractor shall perform all of the construction quality assurance monitoring and testing during the construction of a liner system.
6. Closure shall not proceed in the absence of closure waste discharge requirements.

Landfill Construction Specifications

7. The liner systems of all new waste management units and expansion areas of the existing waste management unit shall be constructed in accordance with the following engineered alternative composite liner design:

- a. The bottom liner shall be comprised, in ascending order, of the following:
 - 1) A twelve-inch thick engineered soil foundation layer that shall be constructed of select fine-grained soil materials which shall be compacted in lifts of six inches or less to 90% of maximum dry density and at 0% to 4% wet of optimum moisture content, in accordance with the approved construction quality assurance plan, and shall be either:
 - a) Compacted to attain a hydraulic conductivity of 1×10^{-6} cm/sec or less;
or
 - b) Meet the following gradation criteria:
 1. A maximum size of ½-inch;
 2. At least 30% of the material, by weight, passing the No. 200 U.S. Standard sieve; and
 3. A gradation series (i.e., well-graded) that is amenable to compaction.
 - 2) A geosynthetic clay layer (GCL) that shall exhibit appropriate strength characteristics to accommodate stresses associated with specific landfill design parameters, with particular attention to interface, long-term creep shear, and bearing capacity.
 - 3) A 60-mil thick synthetic flexible membrane of high-density polyethylene (HDPE).
 - 4) A minimum 12-inch thick drainage layer composed of granular material with a minimum hydraulic conductivity of 0.3 centimeters per second (cm/s).
 - 5) A nonwoven filter geotextile.
 - 6) A two-foot thick soil operations layer.
- b. The side slope liner shall be comprised, in ascending order, of the following:
 - 1) A prepared subgrade that meets the criteria contained in Construction Specification D.8, below.

- 2) A GCL that shall exhibit appropriate strength characteristics to accommodate stresses associated with specific landfill design parameters, with particular attention to interface, long-term creep shear, and bearing capacity.
 - 3) A 60-mil thick synthetic flexible membrane of HDPE.
 - 4) A two-foot thick soil operations layer.
8. The subgrade for the bottom and the side slopes of the Unit shall be prepared in an appropriate manner using accepted engineering and construction methods so as to provide a smooth surface that is free from rocks, sticks, or other debris that could damage or otherwise limit the performance of the GCL.
 9. After the operations layer is installed, the entire base liner system shall be tested for the presence of defects using the electrical leak detection survey method. All detected defects shall be repaired before waste is discharged to the unit. The location and nature of each detected defect shall be noted in the construction report.
 10. If monitoring reveals substantial or progressive increases of leachate generation above the design leachate flow volume of 4.4 gallons per minute (see Finding No. 61) by the Unit or portion of the Unit, such that the depth of fluid on any portion of the leachate collection and removal system (excluding the leachate removal pump sump) exceeds 30 cm, the Discharger shall immediately notify the Central Valley Water Board in writing within seven days. The notification shall include a timetable for remedial or corrective action necessary to achieve compliance with the leachate depth limitation.

Surface Impoundment Construction Specifications

11. New Class II surface impoundments shall be constructed in accordance with the following prescriptive standard double-composite liner design, in ascending order:
 - a. A lower composite liner consisting of a compacted soil layer that is a minimum of two feet thick with a hydraulic conductivity of 1×10^{-7} cm/sec or less and has a minimum relative compaction of 90%. Immediately above the compacted soil layer, and in direct and uniform contact with the soil layer, shall be a synthetic flexible membrane component that shall be at least 40-mil thick (or at least 60-mil thick if composed of high density polyethylene [HDPE]), which is immediately overlain with a leachate collection and removal system; and

- b. An upper composite liner consisting of a geocomposite clay liner (GCL). Immediately above and in direct and uniform contact with the GCL shall be a synthetic flexible membrane component that shall be at least 40-mil thick (or at least 60-mil thick if composed of high density polyethylene [HDPE]).
12. Surface impoundments shall be designed, constructed, and operated to maintain a freeboard of two (2) feet plus the rainfall and leachate produced from a 1,000 year, 24 hour precipitation event or 2 feet plus the 100 year wet season precipitation, whichever is greater. At no time shall the freeboard of an impoundment be less than two feet.
13. Any direct-pipeline discharge to a surface impoundment shall be either equipped with devices or shall have fail-safe operating procedures to prevent overfilling.
14. Surface impoundments shall be designed, constructed, and maintained to prevent scouring and/or erosion of the liner(s) and other containment features at points of discharge to the impoundment and by wave action at the waterline.
15. Liquids removed from a surface impoundment leachate collection and removal system shall be disposed of in accordance with Title 27 and in a manner consistent with its waste classification.
16. Leachate generation from any surface impoundment shall not exceed 85% of the design capacity of the leachate collection and removal system and/or sump pump. If leachate generation exceeds this value and/or if the depth of fluid in a leachate collection and removal system exceeds the minimum needed for safe and efficient pump operation, then the Discharger shall immediately cease the discharge of waste, excluding leachate, to the impoundment and shall notify the Central Valley Water Board in writing within seven days. Notification shall include a time table for remedial action to repair the upper composite liner of the impoundment or other action(s) necessary to reduce leachate production.
17. Solids which accumulate in the surface impoundment(s) shall be periodically removed to maintain minimum freeboard requirements and to maintain sufficient capacity for landfill and surface impoundment leachate and for the discharge of wastes. Prior to removal of these solids, sufficient samples shall be taken for their characterization and classification pursuant to Chapter 15 and Title 27. The rationale for the sampling protocol used, the results of this sampling, and a rationale for classification of the solids shall be submitted to the Executive Officer for review and approval.

E. DETECTION MONITORING SPECIFICATIONS

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1. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater and the unsaturated zone, and in accordance with Monitoring and Reporting Program No. R5-2006-0022. A detection monitoring program for a new Unit shall be installed, operational, and one year of monitoring data collected prior to the discharge of wastes [Title 27 CCR Section 20415(e)(6)].
2. The Discharger shall provide Central Valley Water Board staff a minimum of **one week** notification prior to commencing any field activities related to the installation, repair, or abandonment of monitoring devices, and a minimum 48 hour notification prior to the collection of samples associated with a detection monitoring program, evaluation monitoring program, or corrective action program.
3. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, Monitoring and Reporting Program No. R5-2006-0022, and the Standard Provisions and Reporting Requirements, dated April 2000.
4. The Water Quality Protection Standard for organic compounds which are not naturally occurring and not detected in background groundwater samples shall be taken as the detection limit of the analytical method used (i.e., US-EPA methods 8260 and 8270). The repeated detection of one or more non-naturally occurring organic compounds in samples above the Water Quality Protection Standard from detection monitoring wells is evidence of a release from the Unit.
5. The concentrations of the constituents of concern in waters passing the Point of Compliance shall not exceed the concentration limits established pursuant to Monitoring and Reporting Program No. R5-2006-0022.
6. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the Water Quality Protection Standard using procedures specified in Monitoring and Reporting Program No. R5-2006-0022 and Title 27 CCR Section 20415(e).
7. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken **within a span not to exceed 30 days**, unless the Executive Officer approves a longer time period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of: (1) *Methods for the Analysis of Organics in Water and Wastewater* (USEPA 600 Series), (2) *Test Methods for Evaluating Solid Waste* (SW-846, latest edition), and (3) *Methods for Chemical Analysis of Water and Wastes*

(USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan.

8. If methods other than USEPA-approved methods or Standard Methods are used, the exact methodology shall be submitted for review and approval by the Executive Officer prior to use.
9. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90% non-numerical determinations (i.e., "trace" or "ND") in data from background monitoring points for that medium, the analytical method having the lowest method detection limit (MDL) shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.
10. **"Trace" results** - results falling between the MDL and the practical quantitation limit (PQL) - shall be reported as such, and shall be accompanied both by the estimated MDL and PQL values for that analytical run.
11. **MDLs and PQLs** shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs.
12. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged accordingly, along with estimates of the detection limit and quantitation limit actually achieved. **The MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result.** The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.
13. All **QA/QC data** shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples,

the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged.

14. Unknown chromatographic peaks shall be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in future sampling events. Identification of unknown chromatographic peaks that recur in subsequent sampling events may be required.
15. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to Title 27 CCR Section 20415(e)(7) that is used in the statistical method shall be **the lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the WDRs for routine laboratory operating conditions that are available to the facility. The Discharger's technical report, pursuant to Title 27 CCR Section 20415(e)(7), shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, California Code of Regulations, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) shall be identified and used in appropriate statistical or nonstatistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties".
16. Background for water samples or soil-pore gas samples shall be represented by the data from all samples taken from applicable background monitoring points during that reporting period (at least one sample from each background monitoring point). The Discharger may propose an alternate statistical method [to the methods listed under Title 27 CCR Section 20415(e)(8)(A-D)] in accordance with Title 27 CCR Section 20415(e)(8)(E), for review and approval by the Executive Officer.
17. The Discharger may propose an alternate statistical method [to the methods listed under Title 27 CCR §20415(e)(8)(A-D)] in accordance with Title 27 CCR Section 20415(e)(8)(E), for review and approval by the Executive Officer. Upon receiving written approval from the Executive Officer, alternate statistical procedures may be used for determining the significance of analytical results for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate).

Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Central Valley Water Board staff.

18. The Discharger shall use the following non-statistical method for all analytes that are detected in less than 10% of the background samples. The non-statistical method shall be implemented as follows:
 - a. From the constituent of concern or monitoring parameter list, identify each analyte in the **current** sample that exceeds either its respective MDL or PQL. The Discharger shall conclude that the exceedance provides a preliminary indication of a release or a change in the nature or extent of the release, at that monitoring point, if *either*:
 - 1) The data contains two or more analytes that are detected in less than 10% of background samples that equal or exceed their respective MDLs; or
 - 2) The data contains one or more analyte that equals or exceeds its PQL.
 - b. **Discrete Retest** [Title 27 CCR Section 20415(e)(8)(E)]:
 - 1) In the event that the Discharger concludes (pursuant to paragraph 18.a., above) that there is a preliminary indication of a release, then the Discharger shall immediately notify Central Valley Water Board staff by phone or e-mail and, within 30 days of such indication, shall collect two new (retest) samples from the monitoring point where the release is preliminarily indicated.
 - 2) For any given retest sample, the Discharger shall include, in the retest analysis, **only the laboratory analytical results for those analytes detected in the original sample**. As soon as the retest data are available, the Discharger shall conclude that there is measurably significant evidence of a release if two or more analytes equal or exceed their respective MDLs or if one or more analyte equals or exceeds its PQL and shall:
 - a) **Immediately** notify the Central Valley Water Board about any constituent or constituents verified to be present at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of validation; and
 - b) Comply with Detection Monitoring Specification E.19, below if any constituent or constituents were verified to be present.

- 3) Any analyte that triggers a discrete retest per this method shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event
19. If the Discharger determines that there is measurably significant evidence of a release from the Unit at any monitoring point, the Discharger shall **immediately** implement the requirements of **XI. Response To A Release, C. Release Has Been Verified**, contained in the Standard Provisions and Reporting Requirements.

F. EVALUATION MONITORING SPECIFICATIONS

1. The Central Valley Water Board has identified the County of Merced and the cities of Atwater, Dos Palos, Gustine, Livingston, Los Banos, and Merced (jointly referred to as Discharger) as the primary or active responsible discharger for purposes of California Water Code, Section 13307.1. **By 1 May 2006**, the Discharger shall submit a letter to the Central Valley Water Board that identifies all current record owners of fee title of the site. For purposes of this provision, the site includes the landfill property. The Discharger shall certify to the Central Valley Water Board that the required notifications have been made at the time a cleanup or site closure proposal is made or before the Central Valley Water Board makes a determination that no further action is required. If property ownership changes in the future, the Discharger must notify the Central Valley Water Board **within 30 calendar days** of the date on which it is informed of the change.
2. **By 1 November 2006**, the Discharger shall submit a work plan to complete an Evaluation Monitoring Program that meets the provisions of §20425(b) of Title 27 and this Order.
3. **By 1 February 2007**, the Discharger shall complete an Evaluation Monitoring Program to the satisfaction of the Executive Officer and that meets the provisions of §20425(b) of Title 27, and a report shall be submitted that describes all actions and monitoring taken to complete the Evaluation Monitoring Program.
4. The Discharger shall submit a **semi-annual** status report to the Central Valley Water Board in accordance with the schedule for semi-annual self-monitoring reports contained in Monitoring and Reporting Program No. R5-2006-0022. The report shall describe the progress made to comply with this Order. The semi-annual status report shall include a description of all activities, water quality monitoring, and water quality analyses conducted, since the previous semi-annual status report was prepared, to comply this Order. More frequent reporting may be required as necessary to ensure the protection of human health or the environment.

5. At a minimum, the following documentation is needed to complete the Evaluation Monitoring Program:
 - a. An analysis of all the information gathered to determine the lateral and vertical extent of each waste constituent released from the Unit. This assessment shall include a determination of the spatial distribution and concentration of each constituent of concern throughout the zone affected by the release.
 - b. An assessment of the lateral and vertical extent for each waste constituent in groundwater shall be determined when the constituent no longer meets the trigger criteria for detection in accordance with the detection monitoring program contained in Monitoring and Reporting Program No. R5-2006-0022. For a non-naturally occurring waste constituent, the extent will be determined when groundwater sample analyses do not detect any non-naturally occurring waste constituents at or above the practical quantitation limit (PQL), or no more than one non-naturally occurring waste constituent is detected at or above the method detection limit (MDL) and below the PQL. For naturally occurring waste constituents, or waste constituents that have a statistically derived water quality protection standard, the extent will be determined when groundwater sample analyses do not detect a released constituent at a “measurably significant” concentration as defined by the water quality protection standard.
 - c. A determination of the water quality protection standard for evaluation monitoring shall be based on a sufficient number of background monitoring points that represent the quality of groundwater (organic and inorganic compounds) in the uppermost aquifer that has not been affected by a release from the Unit in accordance with §20415(b)(1) and §20415(b)(2) of Title 27. If more than one water bearing zone is present beneath the Unit and included in the evaluation monitoring program, then a water quality protection standard shall be established independently for each water bearing zone.
 - d. A table listing the constituents of concern that includes the concentration limit for metals and general water quality parameters based on a statistical evaluation of the background concentrations of these parameters.
 - e. A description of how the determination of the spatial distribution and concentration of each constituent of concern throughout the zone affected by the release was accomplished.
6. **By 1 February 2007**, the Discharger shall submit, pursuant to §20425(c) of Title 27, a report containing a final engineering feasibility study for corrective action pursuant to §20420(k)(6) of Title 27. At a minimum, the feasibility study shall contain a detailed

description of the corrective action measures that could be taken to achieve background concentrations for all constituents of concern.

7. **By 1 August 2007**, the Discharger shall submit, pursuant to §20425(d) of Title 27, an amended Report of Waste Discharge, based on the data collected pursuant to Evaluation Monitoring Specification F.5 and on the engineering feasibility study submitted pursuant to Evaluation Monitoring Specification F.6, to establish a corrective action program meeting the requirements of §20430 of Title 27. The amended Report of Waste Discharge shall contain a plan and proposed time schedule to cleanup and abate the effects of all waste discharged to the soil and groundwater from the Unit.
8. In conjunction with the assessment conducted pursuant to Evaluation Monitoring Specification F.5, and while awaiting final approval of the amended Report of Waste Discharge, submitted pursuant to Evaluation Monitoring Specification F.7, the Discharger shall monitor groundwater, surface water, and the unsaturated zone to evaluate changes in water quality resulting from the release from the Unit. In conducting this monitoring, the Discharger shall comply with the requirements of §20425(e) of Title 27.

G. PROVISIONS

1. The Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with all applicable provisions of Title 27 and 40 Code of Federal Regulations Part 258 (Subtitle D) that are not specifically referred to in this Order.
3. The Discharger shall comply with Monitoring and Reporting Program No. R5-2006-0022, which is incorporated into and made part of this Order.
4. The Discharger shall comply with the applicable portions of the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258 et seq.)*, dated April 2000, which are hereby incorporated into this Order.
5. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the

appropriate Central Valley Water Board office by telephone **as soon as** it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing **within two weeks**. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.

6. All reports and transmittal letters shall be signed by persons identified below:
 - a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor.
 - c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
 - d. A duly authorized representative of a person designated in a, b or c above if;
 - 1) The authorization is made in writing by a person described in a, b, or c of this provision;
 - 2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a Unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
 - 3) The written authorization is submitted to the Central Valley Water Board.
 - e. Any person signing a document under this Section shall make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”
7. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall

include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.

8. The owner of the waste management facility shall have the continuing responsibility to assure protection of waters of the state from discharged wastes and from gases and leachate generated by discharged waste during the active life, closure, and postclosure maintenance period of the Unit(s) and during subsequent use of the property for other purposes.
9. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger's violations of the Order.
10. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Central Valley Water Board requesting transfer of the Order within 14 days of assuming ownership or operation of this facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory requirements contained in Provision G.6 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer of this Order shall be approved or disapproved by the Central Valley Water Board.
11. The Discharger shall conduct an annual review of the financial assurance for initiating and completing corrective action, and submit a report for Executive Officer review and approval. The assurances of financial responsibility shall provide that funds for corrective action shall be available to the Central Valley Water Board upon the issuance of any order under California Water Code, Division 7, Chapter 5. The Discharger shall adjust the cost annually to account for inflation and any changes in facility design, construction, or operation.
12. The Discharger shall conduct an annual review of the financial assurance for closure and postclosure maintenance, and submit a report for Executive Officer review and approval. The assurances of financial responsibility shall provide that funds for closure and postclosure maintenance shall be available to the Central Valley Water Board upon the issuance of any order under California Water Code, Division 7, Chapter 5. The Discharger shall adjust the cost annually to account for inflation and any changes in facility design, construction, or operation.

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13. The Discharger shall complete the tasks contained in these waste discharge requirements in accordance with the following time schedule:

<u>Task</u>	<u>Compliance Date</u>
a. Construction	
1) Construction Plans	
Submit construction and design plans for Executive Officer review and approval. (see Construction Specification D.1)	A minimum of 120 days prior to construction
2) Construction Report	
Submit a construction report upon completion demonstrating construction was in accordance with approved construction plans for Executive Officer review and approval. (see Construction Specification D.4)	Prior to discharge
<u>Task</u>	<u>Compliance Date</u>
b. Evaluation Monitoring	
1) Submit a letter identifying all current record owners of fee title of the site (see Evaluation Monitoring Specification No. F.1)	1 May 2006
2) Submit a work plan for completing an Evaluation Monitoring Program (see Evaluation Monitoring Specification No. F.2)	1 November 2006
3) Submit a report describing completion of the Evaluation Monitoring Program (see Evaluation Monitoring Specification No. F.3)	1 February 2007
4) Submit a final engineering feasibility study for a corrective action program (see Evaluation Monitoring Specification No. F.6)	1 February 2007
5) Submit an amended report of waste discharge to establish a corrective action program	1 August 2007

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(see Evaluation Monitoring Specification No. F.7)

c. Financial Assurance Review

- | | | |
|----|---|---------------------------|
| 1) | Annual Review of Financial Assurance for
initiating and completing corrective action
(see Provision G.11) | 30 April each year |
| 2) | Annual Review of Financial Assurance for
closure and postclosure maintenance
(see Provision G.12) | 30 April each year |

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provision of this Order, the Executive Officer may apply to the Attorney General for judicial enforcement or issue a complaint for Administrative Civil Liability.

I, KENNETH D. LANDAU, Acting Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 26 January 2006.

KENNETH D. LANDAU, Acting Executive Officer

DEE:dee/rac:1/26/06

INFORMATION SHEET

ORDER NO. R5-2006-0022
WASTE DISCHARGE REQUIREMENTS
COUNTY OF MERCED
AND
CITIES OF ATWATER, DOS PALOS, GUSTINE,
LIVINGSTON, LOS BANOS, AND MERCED
FOR CONSTRUCTION AND OPERATION
HIGHWAY 59 SOLID WASTE LANDFILL
MERCED COUNTY

The County of Merced operates the Highway 59 Landfill about six miles north of the City of Merced. The facility is jointly owned by the County of Merced and the cities of Atwater, Dos Palos, Gustine, Livingston, Los Banos, and Merced (hereafter jointly referred to as Discharger). The 222-acre waste management facility contains an existing unlined Class III solid waste management unit (Unit), an existing composite-lined Class III Unit, a Class II surface impoundment, and two stormwater retention basins. The Discharger proposes to construct a new Unit in a 140-acre area north of the existing Units.

The climate in the central San Joaquin Valley is semi-arid, with hot, dry summers and cool winters. The average annual precipitation is 11.7 inches with a mean pan evaporation of 67.3 inches. The site is not within a 100-year floodplain according to FEMA maps.

The soils immediately underlying the facility were deposited as alluvial fan sediments and consist of poorly-sorted clays, silt, sand and gravel, with some beds of claystone, siltstone, sandstone, and conglomerate. The site is not within a known fault hazard zone.

Surface drainage from the facility flows to Fahrens Creek. Fahrens Creek is tributary to Bear Creek and the San Joaquin River. Storm water runoff is permitted by California General Industrial Storm Water Permit No. 5B24S000444.

The first encountered groundwater is approximately 65 feet below the native ground surface, and fluctuates as much as nine feet. The direction of groundwater flow is toward the southwest, with an average gradient of approximately 0.001 feet per foot. The average groundwater velocity is 1.5 to 1.9 feet per year. Monitoring data indicates background groundwater quality has an electrical conductivity (EC) ranging between 200 and 300 micromhos/cm, with total dissolved solids (TDS) ranging between 140 and 210 mg/l.

Groundwater quality is monitored by eight on-site detection monitoring wells. Six other wells have been installed for monitoring groundwater in the vicinity of the planned northward expansion area. The vadose zone detection monitoring system consists of geomembrane-lined pan lysimeters installed beneath the leachate collection and removal system collection pipes and sumps of the composite-lined Unit. The Discharger has also installed gas monitoring wells along the perimeters of the unlined Unit, which serve as vadose zone monitoring devices for the unlined area.

Leachate generated from the existing lined unit exhibits concentrations of volatile organic compounds and inorganic constituents of concern in excess of water quality standards. In addition, the site's geologic characteristics where the Unit is located do not permit adequate attenuation of leachate in the

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event of a release from the Unit. As such, the leachate is classified as a designated waste, pursuant to the definition of “designated waste” in §13173 of the California Water Code.

The Discharger submitted a demonstration that construction of an engineered alternative single-composite liner system will meet the performance standard for a Class III landfill contained in §20310 of Title 27. Therefore, this order requires new landfill units to be constructed with the proposed engineered alternative single-composite liner system. The Discharger also proposes to install pan lysimeters beneath the proposed Unit constructed in the 140-acre expansion area to the north for the purpose of vadose zone monitoring. Two Class II surface impoundments will be constructed for disposal of leachate generated by the proposed landfill Unit. The surface impoundments will require double-composite liner construction.

The Discharger proposes to accept treated wood waste at the Highway 59 Landfill. Existing law regulates the control of hazardous waste, but exempts from the hazardous waste control laws, wood waste that is exempt from regulation under the federal Resource Conservation and Recovery Act of 1976, as amended (RCRA), if the wood waste is disposed of in a municipal landfill that meets certain requirements imposed pursuant to the Porter-Cologne Water Quality Control Act for the classification of disposal sites, and the landfill meets other specified requirements outlined in Sections 25143.1.5, 25150.7, and 25150.8 of the Health and Safety Code. The Discharger has indicated that all treated wood waste accepted at the Highway 59 Landfill will be handled and disposed of in accordance with the provisions outlined in Sections 25143.1.5, 25150.7, and 25150.8 of the Health and Safety Code. The Highway 59 Landfill appears to meet the necessary requirements imposed pursuant to the Porter-Cologne Water Quality Control Act. This order therefore allows the disposal of treated wood waste in accordance with the conditions imposed pursuant to the Health and Safety Code.

Volatile organic compounds are often detected in a release from a landfill, and are the primary waste constituents detected in groundwater beneath a municipal solid waste landfill. Since volatile organic compounds are not naturally occurring, and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a Unit. Title 27 does provide for the non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a Unit. However, Title 27 does not specify a specific method for non-statistical evaluation of monitoring data.

The Central Valley Regional Water Quality Control Board may specify a non-statistical data analysis method pursuant to Section 20080(a)(1) of Title 27. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a Unit, this Order specifies a non-statistical method for the evaluation of monitoring data.

The specified non-statistical method for evaluation of monitoring data in this Order provides two criteria (or triggers) for making the determination that there has been a release of waste constituents from a Unit. The presence of two waste constituents above their respective method detection limit (MDL), or one waste constituent detected above its practical quantitation limit (PQL), indicates that a release of waste from a Unit has occurred. Following an indication of a release, verification testing will be conducted to

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determine whether there has been a release from the Unit, or there is a source of the detected constituents other than the landfill, or the detection was a false detection. Although the detection of one waste constituent above its MDL is sufficient to provide for the earliest possible detection of a release in accordance with Title 27, the detection of two waste constituents above the MDL as a trigger is appropriate due to the higher risk of false-positive analytical results and the corresponding increase in sampling and analytical expenses from the use of detecting one waste constituent above its MDL as a trigger.

The pollutant dichlorodifluoromethane has repeatedly been detected in well MW-2A at concentrations exceeding the U.S.E.P.A. National Ambient Water Quality Criteria, One-in-a-Million Incremental Cancer Risk Estimate for Health and Welfare Protection (0.19 ug/l). Other constituents detected on two or more consecutive occasions below water quality goals include benzene, toluene, tetrachloroethylene, and trichlorofluoromethane. The Discharger is currently conducting evaluation monitoring in accordance with Cleanup and Abatement Order No. 98-730. However, the final evaluation monitoring report has not been submitted to date. This order rescinds Order No. 98-730 and requires timely completion of the evaluation monitoring program and implementation of a feasibility study for corrective action.

The Discharger has demonstrated that the Unit as proposed avoids on-site wetlands to the maximum extent practicable and where impracticable, the impact is minimized and those impacts are mitigated to ensure no net loss of wetlands. The Discharger has avoided a significant portion of the on-site wetlands and further avoidance is impracticable. The Discharger is required under its federal CWA Section 404 permit and the Biological Opinion to preserve in perpetuity a 168-acre wetland preserve and mitigation area. The Discharger will construct wetland acreage within that the mitigation area in compensation for the acreage lost as part of the Landfill construction.

The Merced County Board of Supervisors certified the final environmental impact report for the facility on 7 December 1999. The Merced County Public Works Department filed a Notice of Determination on 17 September 1999 in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) and CEQA guidelines (14 CCR Section 15000 et seq.). The Central Valley Water Board considered the environmental impact report and incorporated mitigation measures from the environmental impact report into these waste discharge requirements designed to prevent potentially significant impacts to design facilities and to water quality.

DEE:dee/rac:1/26/06

CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

MONITORING AND REPORTING PROGRAM NO. R5-2006-0022

FOR

COUNTY OF MERCED

AND

CITIES OF ATWATER, DOS PALOS, GUSTINE,
LIVINGSTON, LOS BANOS, AND MERCED

FOR

CONSTRUCTION AND OPERATION
HIGHWAY 59 SOLID WASTE LANDFILL
MERCED COUNTY

Compliance with this Monitoring and Reporting Program, with Title 27, California Code of Regulations, Section 20005, et seq. (hereafter Title 27), and with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258)*, dated April 2000, is ordered by Waste Discharge Requirements Order No. R5-2006-0022.

A. REQUIRED MONITORING REPORTS

<u>Report</u>	<u>Due</u>
1. Groundwater Monitoring (Section D.1)	See Table I
2. Unsaturated Zone Monitoring (Section D.2)	See Table II
3. Leachate Monitoring (Section D.3)	See Table III
4. Facility Monitoring (Section D.4)	As necessary
5. Annual Monitoring Summary Report (Section E.5.)	Annually
6. Response to a Release (Standard Provisions and Reporting Requirements)	As necessary

B. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in Order No. R5-2006-0022 and the Standard Provisions and Reporting Requirements. Reports which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the waste discharge requirements. In reporting the monitoring data

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required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format acceptable to the Executive Officer.

Each monitoring report shall include a compliance evaluation summary as specified in E. Reporting Requirements of this Monitoring and Reporting Program.

Field and laboratory tests shall be reported in each monitoring report. Monthly, quarterly, semiannual, and annual monitoring reports shall be submitted to the Central Valley Water Board in accordance with the following schedule for the calendar period in which samples were taken or observations made.

<u>Sampling Frequency</u>	<u>Reporting Frequency</u>	<u>Reporting Periods End</u>	<u>Report Date Due</u>
Monthly	Quarterly	Last Day of Month	by Semiannual Schedule
Quarterly	Quarterly	31 March	31 July
		30 June	31 July
		30 September	31 January
		31 December	28 January
Semiannually	Semiannually	30 June	31 July
		31 December	31 January
Annually	Annually	31 December	31 January
Pentannually	Pentannually	31 December	31 January*

*Years ending in 20x0 or 20x5

The Discharger shall submit an **Annual Monitoring Summary Report** to the Central Valley Water Board covering the previous monitoring year. The annual report shall contain the information specified in E. Reporting Requirements of this Monitoring and Reporting Program, and a discussion of compliance with the waste discharge requirements and the Water Quality Protection Standard.

The results of **all monitoring** conducted at the site shall reported to the Central Valley Water Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

For each waste management unit (Unit), the Water Quality Protection Standard shall consist of all constituents of concern, the concentration limit for each constituent of concern, the point of compliance, and all water quality monitoring points.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the constituents of concern, the concentration limits, and the point of compliance and all monitoring points. The Executive Officer shall review and approve the Water Quality Protection Standard, or any modification thereto, for each monitored medium.

The report shall:

- a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a Unit or portion of a Unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with §20405 of Title 27.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

2. Constituents of Concern

The constituents of concern include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or

derived from waste contained in the Unit. The constituents of concern for all Units at the facility are those listed in Tables I through III for the specified monitored medium, and Table V. The Discharger shall monitor all constituents of concern every five years, or more frequently as required in accordance with a Corrective Action Program.

a. **Monitoring Parameters**

Monitoring parameters are constituents of concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters for all Units are those listed in Tables I through IV for the specified monitored medium.

3. Concentration Limits

For a naturally occurring constituent of concern, the concentration limit for each constituent of concern shall be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to §20415 of Title 27; or
- b. By an alternate statistical method acceptable to the Executive Officer in accordance with §20415 of Title 27.

The established concentration limits for naturally occurring constituents of concern are listed in Table VI.

4. Point of Compliance

The point of compliance for the water standard at each Unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit.

5. Compliance Period

The compliance period for each Unit shall be the number of years equal to the active life of the Unit plus the closure period. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the Unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program.

D. MONITORING

The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater and the unsaturated zone, in accordance with Detection Monitoring Specifications E.1 and E.3 of Waste Discharge Requirements, Order No. R5-2006-0022. Detection monitoring for a new facility or a new Unit or impoundment shall be installed, operational, and one year of monitoring data collected **prior to** the discharge of wastes. All monitoring shall be conducted in accordance with a Sample Collection and Analysis Plan, which includes quality assurance/quality control standards, that is acceptable to the Executive Officer.

All point of compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, leachate, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern as indicated and listed in Tables I through III.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those which cannot be quantified and/or specifically identified. Metals shall be analyzed in accordance with the methods listed in Table V.

The Discharger may, with the approval of the Executive Officer, use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program.

1. Groundwater

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of §20415 and §20420 of Title 27 in accordance with a Detection Monitoring Program approved by the Executive Officer. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan.

The Discharger shall determine the groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional zone of saturation monitored pursuant to this Monitoring and Reporting Program, and report the results semiannually, including the times of highest and lowest elevations of the water levels in the wells.

Hydrographs of each well shall be submitted showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.

Groundwater samples shall be collected from the point-of-compliance wells, background wells, and any additional wells added as part of the approved groundwater monitoring system. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table I.

The monitoring parameters shall also be evaluated each reporting period with regards to the cation/anion balance, and the results shall be graphically presented using a Stiff diagram, a Piper graph, or a Schueller plot. Samples for the constituents of concern specified in Table I shall be collected and analyzed in accordance with the methods listed in Table V every five years.

2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of §20415 and §20420 of Title 27 in accordance with a detection monitoring plan approved by the Executive Officer. The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in the approved Sample Collection and Analysis Plan.

Unsaturated zone samples shall be collected from the monitoring devices and background monitoring devices of the approved unsaturated zone monitoring system. The collected samples shall be analyzed for the listed constituents in accordance with the methods and frequency specified in Table II. All monitoring parameters shall be graphed so as to show historical trends at each monitoring point. Samples for the constituents of concern specified in Table II shall be collected and analyzed in accordance with the methods listed in Table V every five years.

The pan lysimeters shall be checked monthly for liquid and monitoring shall also include the total volume of liquid removed from the system. Unsaturated zone monitoring reports shall be included with the corresponding semiannual groundwater monitoring and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

3. Leachate Monitoring

All Unit leachate collection and removal system sumps shall be inspected monthly for leachate generation. Upon detection of leachate in a previously dry leachate collection and removal system, leachate shall be sampled **immediately** and analyzed for the constituents listed in Table III. Leachate shall then be sampled and analyzed annually during the fourth quarter thereafter, with a retest during the following second quarter if constituents are detected that have not been previously detected. Leachate samples shall be collected and analyzed for the listed constituents in accordance with the methods and frequency specified in Table III. The constituents of concern list shall include all constituents listed in Table VI. The quantity of leachate pumped from each sump shall be measured and reported monthly as Leachate Flow Rate (in gallons).

Leachate which seeps to the surface from the Unit shall be sampled and analyzed for the constituents listed in Table III upon detection. The quantity of leachate shall be *estimated* and reported as Leachate Flow Rate (in gallons/day).

4. Facility Monitoring

a. Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess damage to the drainage control system, groundwater monitoring equipment (including wells, etc.), and shall include the Standard Observations contained in Section E.3.f. of this Monitoring and Reporting Program. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. By **15 November** of each year, the Discharger shall submit an annual report describing the results of the inspection and the repair measures implemented, including photographs of the problem and the repairs.

b. Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following *major storm events*. Necessary repairs shall be completed **within 30 days** of the inspection. The Discharger shall report any damage and subsequent repairs within 45 days of completion of the repairs, including photographs of the problem and the repairs.

E. REPORTING REQUIREMENTS

1. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the postclosure period.

Such legible records shall show the following for each sample:

- a. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
 - b. Date, time, and manner of sampling;
 - c. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
 - d. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
 - e. Calculation of results; and
 - f. Results of analyses, and the MDL and PQL for each analysis.
2. A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report.
 3. Each monitoring report shall include a compliance evaluation summary. The summary shall contain at least:
 - a. For each monitoring point and background monitoring point addressed by the report, a description of:
 - 1) The time of water level measurement;

- 2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
 - 3) The method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken;
 - 4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
 - 5) A statement that the sampling procedure was conducted in accordance with the approved Sampling and Analysis Plan.
- b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
 - c. For each groundwater body, a description and graphical presentation of the gradient and direction of groundwater flow under/around the Unit, and the groundwater flow rate, based upon water level elevations taken prior to the collection of the water quality data submitted in the report.
 - d. Laboratory statements of results of all analyses evaluating compliance with requirements.
 - e. An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities.
 - f. A summary and certification of completion of all **Standard Observations** for the Unit(s), for the perimeter of the Unit, and for the receiving waters. The Standard Observations shall include:
 - 1) For the Unit:
 - a) Evidence of ponded water at any point on the facility (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.

- 2) Along the perimeter of the Unit:
 - a) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.
- g. The quantity and types of wastes discharged and the locations in the Unit where waste has been placed since submittal of the last such report.
4. The Discharger shall report by telephone any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the Central Valley Water Board **within seven days**, containing at least the following information:
 - a. A map showing the location(s) of seepage;
 - b. An estimate of the flow rate;
 - c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);
 - d. Verification that samples have been submitted for analyses of the Constituents of Concern and Monitoring Parameters, and an estimated date that the results will be submitted to the Central Valley Water Board; and
 - e. Corrective measures underway or proposed, and corresponding time schedule.
5. The Discharger shall submit an **Annual Monitoring Summary Report** to the Central Valley Water Board covering the reporting period of the previous monitoring year. This report shall contain:
 - a. All monitoring parameters and constituents of concern shall be graphed so as to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot downgradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.

- b. Unless otherwise exempted by the Executive Officer, all monitoring analytical data obtained during the previous two six-month reporting periods, shall be submitted in tabular form as well as in a digital file format acceptable to the Executive Officer. The Central Valley Water Board regards the submission in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27 CCR Section 20420(h)], in that this facilitates periodic review by the Central Valley Water Board.
- c. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
- d. A map showing the area and elevations in which filling has been completed during the previous calendar year and a comparison to final closure design contours.
- e. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.
- f. An evaluation of the effectiveness of the leachate monitoring/control facilities.

The Discharger shall implement the above monitoring program on the effective date of this Program.

Ordered by: _____
KENNETH D. LANDAU, Acting Executive Officer

26 January 2006
(Date)

DEE:dee/rac:1/26/06

TABLE I
GROUNDWATER DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Groundwater Elevation	Ft. & hundredths, M.S.L.	Quarterly
Temperature	°C	Semiannual
Electrical Conductivity	µmhos/cm	Semiannual
pH	pH units	Semiannual
Turbidity	Turbidity units	Semiannual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semiannual
Chloride	mg/L	Semiannual
Carbonate	mg/L	Semiannual
Bicarbonate	mg/L	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual
Sulfate	mg/L	Semiannual
Calcium	mg/L	Semiannual
Magnesium	mg/L	Semiannual
Potassium	mg/L	Semiannual
Sodium	mg/L	Semiannual
Volatile Organic Compounds (USEPA Method 8260, see Table IV)	µg/L	Semiannual
Constituents of Concern (see Table V)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

TABLE II

UNSATURATED ZONE DETECTION MONITORING PROGRAM

SOIL-PORE GAS

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Monitoring Parameters		
Volatile Organic Compounds (USEPA Method TO-14)	µg/cm ³	Semiannual
Methane	%	Semiannual

PAN LYSIMETERS (or other vadose zone monitoring device)

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Electrical Conductivity	µmhos/cm	Semiannual
pH	pH units	Semiannual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semiannual
Chloride	mg/L	Semiannual
Carbonate	mg/L	Semiannual
Bicarbonate	mg/L	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual
Sulfate	mg/L	Semiannual
Calcium	mg/L	Semiannual
Magnesium	mg/L	Semiannual
Potassium	mg/L	Semiannual
Sodium	mg/L	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, see Table IV)	µg/L	Semiannual

Constituents of Concern (see Table V)

Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

TABLE III
LEACHATE DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Total Flow	Gallons	Monthly
Flow Rate	Gallons/Day	Monthly
Electrical Conductivity	µmhos/cm	Monthly
pH	pH units	Monthly
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Annually
Chloride	mg/L	Annually
Carbonate	mg/L	Annually
Bicarbonate	mg/L	Annually
Nitrate - Nitrogen	mg/L	Annually
Sulfate	mg/L	Annually
Calcium	mg/L	Annually
Magnesium	mg/L	Annually
Potassium	mg/L	Annually
Sodium	mg/L	Annually
Volatile Organic Compounds (USEPA Method 8260B, see Table IV)	µg/L	Annually
Constituents of Concern (see Table V)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

TABLE IV
MONITORING PARAMETERS FOR DETECTION MONITORING

Surrogates for Metallic Constituents:

pH
Total Dissolved Solids
Electrical Conductivity
Chloride
Sulfate
Nitrate nitrogen

Constituents included in VOC:

USEPA Method 8260B

Acetone
Acrylonitrile
Benzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- 1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC-12)
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Di-isopropylether (DIPE)
Ethanol
Ethyltertiary butyl ether
Ethylbenzene
2-Hexanone (Methyl butyl ketone)
Hexachlorobutadiene

TABLE IV
MONITORING PARAMETERS FOR DETECTION MONITORING
Continued

Hexachloroethane
Methyl bromide (Bromomethene)
Methyl chloride (Chloromethane)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl ethyl ketone (MEK: 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
4-Methyl-2-pentanone (Methyl isobutylketone)
Naphthalene
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride
Xylenes

TABLE V
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

<u>Inorganics (dissolved):</u>	<u>USEPA Method</u>
Aluminum	6010
Antimony	7041
Barium	6010
Beryllium	6010
Cadmium	7131A
Chromium	6010
Cobalt	6010
Copper	6010
Silver	6010
Tin	6010
Vanadium	6010
Zinc	6010
Iron	6010
Manganese	6010
Arsenic	7062
Lead	7421
Mercury	7470A
Nickel	7521
Selenium	7742
Thallium	7841
Cyanide	9010B
Sulfide	9030B

Volatile Organic Compounds:

USEPA Method 8260

Acetone
Acetonitrile (Methyl cyanide)
Acrolein
Acrylonitrile
Allyl chloride (3-Chloropropene)
Benzene
Bromochloromethane (Chlorobromomethane)
Bromodichloromethane (Dibromochloromethane)
Bromoform (Tribromomethane)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Chloroprene
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)

TABLE V
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- 1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC 12)
1,1 -Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1, 1-Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans- 1,2-Dichloroethylene (trans- 1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane (Trimethylene dichloride)
2,2-Dichloropropane (Isopropylidene chloride)
1,1 -Dichloropropene
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Di-isopropylether (DIPE)
Ethanol
Ethyltertiary butyl ether
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
Hexachloroethane
2-Hexanone (Methyl butyl ketone)
Isobutyl alcohol
Methacrylonitrile
Methyl bromide (Bromomethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
Methyl methacrylate
4-Methyl-2-pentanone (Methyl isobutyl ketone)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Naphthalene
Propionitrile (Ethyl cyanide)
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol

TABLE V
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS
Continued

1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)
Toluene
1,2,4-Trichlorobenzene
1,1,1 -Trichloroethane, Methylchloroform
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene; TCE)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride (Chloroethene)
Xylene (total)

Semi-Volatile Organic Compounds:

USEPA Method 8270 - base, neutral, & acid extractables

Acenaphthene
Acenaphthylene
Acetophenone
2-Acetylaminofluorene (2-AAF)
Aldrin
4-Aminobiphenyl
Anthracene
Benzo[a]anthracene (Benzanthracene)
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[g,h,i]perylene
Benzo[a]pyrene
Benzyl alcohol
Bis(2-ethylhexyl) phthalate
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC (Lindane)
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether (Dichloroethyl ether)
Bis(2-chloro-1-methylethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)
4-Bromophenyl phenyl ether
Butyl benzyl phthalate (Benzyl butyl phthalate)

TABLE V
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS
Continued

Chlordane
p-Chloroaniline
Chlorobenzilate
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chrysene
o-Cresol (2-methylphenol)
m-Cresol (3-methylphenol)
p-Cresol (4-methylphenol)
4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate
Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Dieldrin
Diethyl phthalate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidine
2,4-Dimethylphenol (m-Xylenol)
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
Diphenylamine
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde

TABLE V
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS
Continued

Ethyl methanesulfonate
Famphur
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorocyclopentadiene
Hexachloropropene
Indeno(1,2,3-c,d)pyrene
Isodrin
Isophorone
Isosafrole
Kepone
Methapyrilene
Methoxychlor
3-Methylcholanthrene
Methyl methanesulfonate
2-Methylnaphthalene
1,4-Naphthoquinone
1-Naphthylamine
2-Naphthylamine
o-Nitroaniline (2-Nitroaniline)
m-Nitroaniline (3-Nitroaniline)
p-Nitroaniline (4-Nitroaniline)
Nitrobenzene
o-Nitrophenol (2-Nitrophenol)
p-Nitrophenol (4-Nitrophenol)
N-Nitrosodi-n-butylamine (Di-n-butyl nitrosamine)
N-Nitrosodiethylamine (Diethyl nitrosamine)
N-Nitrosodimethylamine (Dimethyl nitrosamine)
N-Nitrosodiphenylamine (Diphenyl nitrosamine)
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propyl nitrosamine)
N-Nitrosomethylethylamine (Methylethyl nitrosamine)
N-Nitrosopiperidine
N-Nitrosopyrrolidine
5-Nitro-o-toluidine
Pentachlorobenzene
Pentachloronitrobenzene (PCNB)
Pentachlorophenol

TABLE V
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS
Continued

Phenacetin
Phenanthrene
Phenol
p-Phenylenediamine
Polychlorinated biphenyls (PCBs; Aroclors)
Pronamide
Pyrene
Safrole
1,2,4,5-Tetrachlorobenzene
2,3,4,6-Tetrachlorophenol
o-Toluidine
Toxaphene
2,4,5-Trichlorophenol
0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene

Chlorophenoxy Herbicides:

USEPA Method 8151A

2,4-D (2,4-Dichlorophenoxyacetic acid)
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Organophosphorus Compounds:

USEPA Method 8141A

Atrazine
Chlorpyrifos
0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)
Diazinon
Dimethoate
Disulfoton
Ethion
Methyl parathion (Parathion methyl)
Parathion
Phorate
Simazine

TABLE VI
WATER QUALITY PROTECTION STANDARD CONCENTRATION LIMITS

<u>Parameter</u>	<u>Units</u>	<u>Monitoring Well Concentration Limits</u>					
	Well No.	<u>MW-1</u>	<u>MW-2A</u>	<u>MW-4A</u>	<u>MW-5</u>	<u>MW-6</u>	<u>MW-7</u>
PH	Units	7.02-8.53	6.83-8.13	6.56-8.62	6.16-8.74	5.86-8.94	6.72-8.14
Electrical Conductivity	µmhos/cm	396	387	353	436	353	363
Chloride	mg/L	24	26	24	29	21	22
Sulfate	mg/L	13	16	16	17	15	16
Nitrate – Nitrogen	mg/L	84	66	69	97	37	57
Total Dissolved Solids	mg/L	312	293	320	372	322	279
Bicarbonate	mg/L	136	117	89	82	124	94
Carbonate	mg/L	5	5	5	5	5	5
Calcium	mg/L	19	34	23	33	17	17
Magnesium	mg/L	10	13	9.1	14	7.8	7.0
Sodium	mg/L	43	39	30	31	34	32
Potassium	mg/L	54	7.9	7.3	6.8	7.2	5.1
Volatile Organic Constituents	µg/L	MDL ¹	MDL ¹	MDL ¹	MDL ¹	MDL ¹	MDL ¹
Semivolatile Organic Constituents	µg/L	MDL ¹	MDL ¹	MDL ¹	MDL ¹	MDL ¹	MDL ¹
Organophosphorous Constituents	µg/L	MDL ¹	MDL ¹	MDL ¹	MDL ¹	MDL ¹	MDL ¹
Chlorinated Herbicides	µg/L	MDL ¹	MDL ¹	MDL ¹	MDL ¹	MDL ¹	MDL ¹

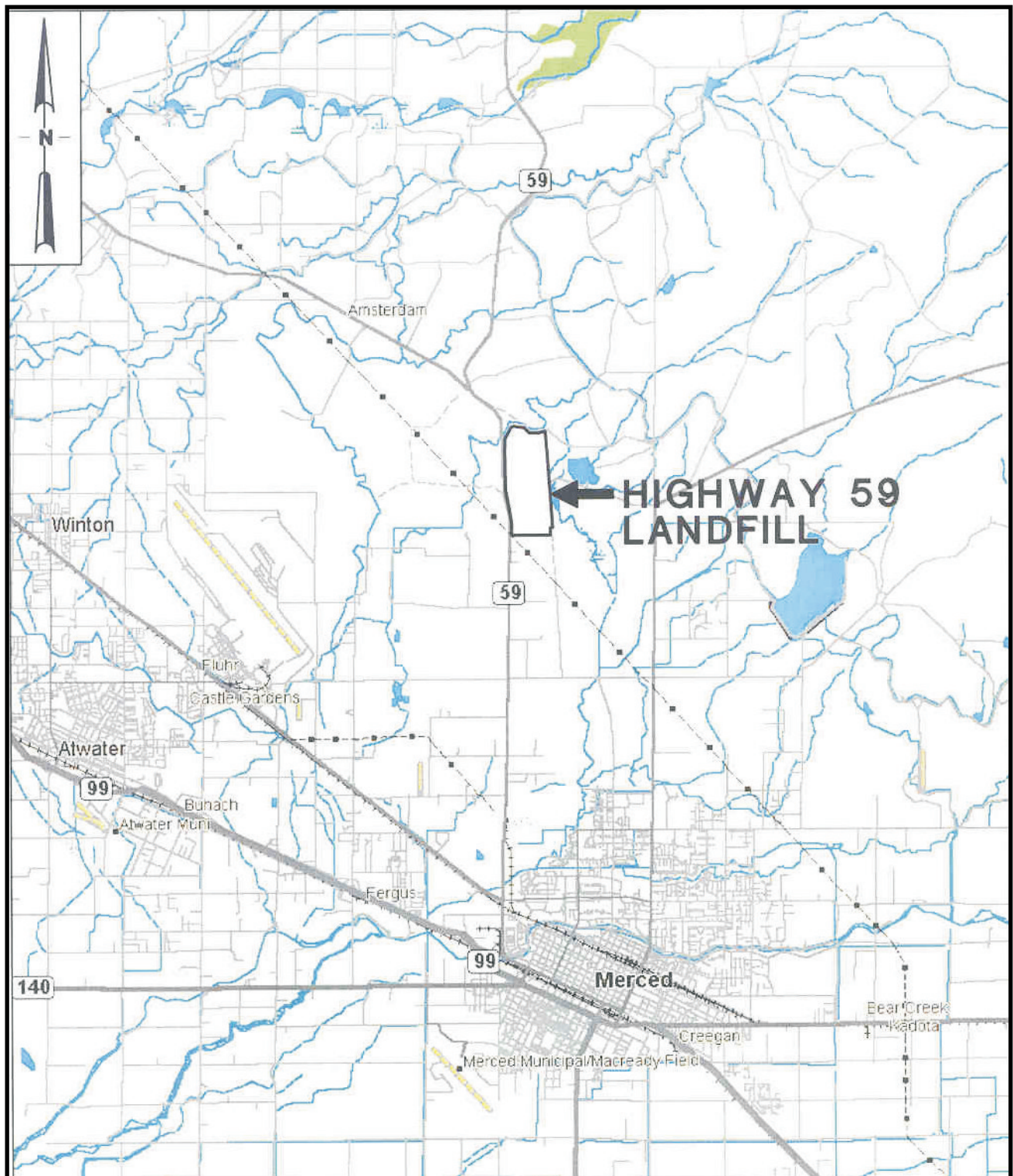
¹MDL = method detection limit

TABLE VI
WATER QUALITY PROTECTION STANDARD CONCENTRATION LIMITS
Continued

<u>Parameter</u>	<u>Units</u>	<u>Monitoring Well Concentration Limits</u>				
	Well No.	<u>MW-8</u>	<u>MW-9</u>	<u>MW-10</u>	<u>MW-11</u>	<u>MW-12</u>
pH	Units	NC ²	7.07-8.33	6.79-7.97	5.94-7.71	6.61-7.75
Electrical Conductivity	µmhos/cm	NC ²	388	1038	894	674
Chloride	mg/L	5.0	24	22	20	23
Sulfate	mg/L	3.8	13	13	15	16
Nitrate - Nitrogen	mg/L	3.7	11	11	14	9.2
Total Dissolved Solids	mg/L	NC ²	296	358	466	364
Bicarbonate	mg/L	NC ²	116	221	461	314
Carbonate	mg/L	5	5	5	5	5
Calcium	mg/L	23	23	37	61	42
Magnesium	mg/L	8.7	9.7	14	27	19
Sodium	mg/L	99	37	47	58	54
Potasssium	mg/L	6.1	4.8	5.8	6.7	6.4
Volatile Organic Constituents	µg/L	MDL ¹	MDL ¹	MDL ¹	MDL ¹	MDL ¹
Semivolatile Organic Constituents	µg/L	MDL ¹	MDL ¹	MDL ¹	MDL ¹	MDL ¹
Organophosphorous Constituents	µg/L	MDL ¹	MDL ¹	MDL ¹	MDL ¹	MDL ¹
Chlorinated Herbicides	µg/L	MDL ¹	MDL ¹	MDL ¹	MDL ¹	MDL ¹

¹MDL = method detection limit

²NC = not calculated



0 2 miles

(Modified after EMCON/OWT Solid Waste Services, Joint Technical Document, Highway 59 Landfill, 2000, Figure 1)

ATTACHMENT A

ORDER NO. R5-2006-0022
WASTE DISCHARGE REQUIREMENTS
FOR COUNTY OF MERCED ET AL.
FOR CONSTRUCTION AND OPERATION
HIGHWAY 59 SOLID WASTE LANDFILL
MERCED COUNTY

